

## I.

### NOTES ON ANCIENT BONE SKATES. BY ROBERT MUNRO, M.D.

As, in a syllogism, the conclusion is necessarily involved in the premises, so, in archæology, every general inference must depend upon the accuracy of the observed facts. More especially is this the case when the problem at issue is of a complex character, such as the determination of the range of a given group of objects in space and time.

The contradictory opinions enunciated by archæologists in regard to the period when bone skates were used, justify the following attempt to define their position in early European civilisation with greater precision than has hitherto been done. Accordingly, I shall ask your attention while I take a rapid survey of the circumstances in which so many of these primitive implements have been found.

During the summer of 1888 I visited Holland, mainly for the purpose of making inquiries as to the nature of certain remarkable mounds called *Terpen*, irregularly scattered over some of its low-lying districts, more especially Friesland, which in recent times have been found to be rich repositories of the industrial remains of the earlier people who inhabited the country. As I have already published an account of those mounds from an archæological point of view, I need not now occupy time by repeating details which, however interesting, could only be regarded as preliminary to the subject of this paper. One observation only I must ask you to bear in mind, viz., that they are the debris of ancient marine pile-dwellings which flourished, at least, from the time of Pliny down to about the 12th century. A few years ago agriculturists discovered that the contents of these *terpen* were possessed of highly ammoniacal properties, which have been since utilised as guano.

For this purpose the *terp* at Aalzum, one of the largest in Friesland, was being excavated at the time of my visit, and so I took the opportunity of examining it, under the guidance of Mr Corbelijn Battaerd, Conservator of the *Leeuwarden* Museum. It seems to be an essential law in this part of the world to submit all antiquarian objects collected in the course of the excavations to the authorities of the Museum before being offered to outsiders, so as to give the former an opportunity of acquiring whatever articles may be considered of national interest. On this occasion the workers—a number of men and women—produced their little hoards for the inspection of Mr Battaerd; and after he had picked out certain objects for the Museum, I selected a few portable things, which, on my return home, I presented to the National Museum in Edinburgh. Among these relics was the bone skate here represented (fig. 1). It is formed of the metacarpal bone of a horse, and is highly



Fig. 1. Bone Skate from a Terp Mound at Aalzum.

polished with use on one side. It measures 9 inches in length, but, with the exception of a small hole at one end, shows no marks by which it could be attached to the foot. There was at the time of my visit a small collection of similar skates in the *Leeuwarden* Museum; but since the *terpen* have been so largely excavated, bone skates have become too common to be of much antiquarian value. In looking over the list of objects acquired for the Museum during the year from October 1889 to October 1890, I find notices of 15 bone skates. The largest (characterised in the *Proceedings* of the Friesch Genootschap as extraordinarily large) was found in a *terp* at Bilgaard, and measures 11 inches in length; the shortest is only  $4\frac{1}{2}$  inches in length. Their average length is about 9 inches. Three are described as having a hole at one end; one as being greatly worn by use; and four as fragments. In the following year the addition to the collection of bone skates was less, being only

ten,—one pair of them having been found in the walls of an old building in Leeuwarden.

In East Friesland mounds similar to the *terpen* are called *Warfen*, and among the industrial remains disinterred from them are also bone skates. One, “in einem Warfe bei Grimersum gefunden,” is figured by Dr Tergast in a small work entitled *Die Heidnischen Alterthümer Ostfrieslands* (fig. 49). This author, however, considers that such objects were used as polishers, and describes them as “Knochen, an einem Seite polirt, zum Glätten des Gewebes.” (*Ibid.*, p. 43.)

The late Dr Lindenschmit figures two bone skates (*Alterthümer unserer Heidnischen Vorzeit, Heft xii., Taf. i., No. 1 bis 4*), one from the museum at Hanover, and the other from the museum at Leiden. The origin of this latter example is supposed to be more precisely defined by adding the words “gefunden in einem Grabhügel bei Oosterend in Friesland.” Dr Lindenschmit also states that similar objects had been found in the provinces of Zeeland, Utrecht, and Geldern.

Baron van Breugel Douglas, in an article on the debris of ancient hearths in Friesland, read at the International Congress of Anthropology and Prehistoric Archæology held in 1869, at Copenhagen, thus refers to bone skates exhibited in the Museum of Northern Antiquities:—

“Avant de finir je me permets de faire à M. le Directeur du Musée des Antiquités du Nord une observation sur des objets qui se trouvent dans une des vitrines de la XV<sup>e</sup> salle (moyen-âge). Ce sont des os droits et polis d'un côté et perforés aux deux bouts d'un trou, connus en Frise comme les patins des anciens Frisons.

Je pense que ces objets doivent être placés dans le premier âge de la classification adoptée, celui de pierre, qui contient aussi d'autres objets en os, aussi bien qu'en corne ou en arêtes. Je sais bien qu'on s'en est servi encore dans des temps postérieurs, mais ce fait ne décide pas la question de l'âge dans lequel ils doivent être placés. A mon avis, c'est celui de leur invention” (p. 181).

Dr Conwentz, director of the Provinzial-Museum in Danzig, informs me that there is one bone skate in the archæological department of this museum. The specimen was found in the bed of the river Motlau, within the town, and is well preserved.

Bone skates are among the relics found on several of the lake-

dwellings in North Germany. The settlements in the Persanzigersee and in the Dabersee, both of which were contemporary with the Burgwälle, have yielded a few specimens associated with other relics described as of Slavish origin. Another specimen, figured in my *Lake-Dwellings of Europe* (fig. 99, No. 14), was found on the *Packwerkbau*, in the Kownatkensee, East Prussia. It is about 9 inches long, and presents a flat surface, highly polished by use. Among the other industrial objects from the same locality, exhibited in the Prussia Museum, Königsberg, were a small stone axe, a worked flint (*ibid.*, Nos. 12 and 13), and some pottery, ornamented with finger and string-marks (*Schnurornament*).

Herr von Schab figures a bone skate from the lake-dwelling in the Lake of Starnberg, Bavaria (Keller's *Swiss Lake Dwellings*, 2d. ed., pl. clxxxii. fig. 36 and p. 593). The assortment of relics from this settlement, deposited in the Archæological Museum at Munich, seems to me to contain stray objects from different civilisations. A horse-shoe with six nail-holes, two iron spears, and a remarkable iron knife of large size (*Lake-Dwellings of Europe*, fig. 37, No. 1), together with some worked objects of bone and horn (*ibid.*, fig. 36, No. 26), undoubtedly belong to a later age than that of the actual lake-dwellers. There is a tradition that the island was originally the site of a heathen temple and a sacred burying-place, which became subsequently appropriated by the Christians, and used by them for similar purposes. Some countenance is given to this tradition by the fact that the workmen, when digging the foundations of the present royal residence built on the ruins of an old ecclesiastical establishment, came upon sepulchral remains of a mixed character—early mediæval, Roman, and prehistoric.

Among the heterogeneous debris of humanity collected in the "trouvaille de Toszeg" in Hungary, now recognised to be analogous in structure to the *terremare* of North Italy, there was an object thus described in the *Catalogue d'exposition préhistorique*, 1876,—“Un os troué aux deux bouts ayant peut-être servi de Patin.”

Another locality said to have yielded a bone skate is the lake-dwelling at Moosseedorf, near Bern. This statement is of some consequence, because if the object can be authenticated as a genuine relic of

the inhabitants of that settlement, we will be compelled to relegate the origin of bone skates back to the pure Stone age. The bone skate reputed to have been found on this station is figured in Keller's *Lake-Dwellings of Switzerland* (Pl. cl. fig. 6), and described as follows (p. 39):—

“One of the uses to which the long bones of animals were applied is singular. This figure is the sketch of a skate made out of the long bone of a horse. It is between 10 and 11 inches long. On one side it has the natural appearance of the bone, but on the other there is a flat polished surface, nearly 9 inches long and about half an inch wide. There are no perforations in the bone, but there are two incisions in front and two projections behind, which would allow of its being fastened to the foot. This specimen was first published by Messrs Albert Jahn and Dr Uhlmann in 1857 (Bern), and subsequently in several other quarters.”

It may be remarked that no notice of this bone skate has appeared in any of Keller's original reports on the *Pfahlbauten*, nor in the first English edition of his works published in 1866.

The most interesting group of antiquities in which are bone skates largely represented is that collected on the ruins of the ancient town of Birka in Sweden. The explorations made on the site of this town are of great archæological value, inasmuch as they illustrate that most famous period of prehistoric times in Scandinavia known as the Viking period. The complete monograph on this great “find,” which I understand is in the course of preparation by Dr Stolpe, is not yet published. The following extract from the guide to the National Museum at Stockholm, where the relics are preserved, will, however, sufficiently explain the circumstances for our present purpose:—

“On the island Björkö, in Lake Mälär, stood the town of Birka, celebrated for its trade, and also for its being the first place where Christianity was preached in Sweden. The northern end of the island is almost completely covered with barrows, as well as three-sided, four-sided, and ‘boat-shaped’ arrangements of stones. The number of such graves visible above the surface of the ground is over 2000, and their number has evidently been greater. Numerous other graves, containing unburned bodies, are not distinguishable above ground through mounds or arrangements of stones. It follows that during the latter part of the heathen period the island had a very numerous population, and the site of an ancient town can also be distinguished.

Along the N.W. coast of the island stretches a cultivated field, more than 20 acres in area, known in common parlance as 'Svarta jorden' (the black earth), the soil of which consists of a compound of charcoal, ashes, and sand, with quantities of animal bones imbedded therein, together with ancient objects of all kinds. The investigations made by Dr Stolpe since 1871 have brought to light that the charcoal and ashes came from the hearths of the inhabitants whose houses were built here, and that the bones were the remains of their meals."

Dr Stolpe then goes on to describe the objects found in those different cemeteries, far too numerous and varied to be here even mentioned. He shows that the graves containing unburned bodies were those of the inhabitants of Birka, who had been converted to Christianity by Ansgar and his followers. The relics collected on the site of the town itself, *i.e.* in the "black earth," consisting of a vast assortment of implements, weapons, ornaments, fabrics, coins, food refuse, &c., &c., are then briefly enumerated. The entire collection from Birka gives a vivid picture of the social life of the period, and particularly of the inhabitants of that flourishing town, from its rise in the middle of the 8th century down to its final destruction about the middle of the 11th century.

Among the miscellaneous objects from the "black earth" are bone skates, two dozen of which I counted in the Björkö collection when I last visited the Stockholm Museum, a couple of years ago. But these are merely specimens, and by no means represent the entire number collected. Dr Stolpe, in an address delivered to the members of the "Congrès International d'Anthropologie et d'Archéologie pré-historiques," on 13th August 1874, long before the entire excavations were completed, thus refers to the bone skates:—

"En hiver, quand la glace recouvrait la surface du lac, on la parcourait sur des patins confectionnés d'os de boeuf ou de cheval, principalement les os du métacarpe et du métatarse et parfois le radius. Près de 300 patins pareils découverts pendant les trois dernières années, témoignent de la vivacité des communications sur la glace du Mälär. Ces instruments de locomotion paraissent avoir été tout aussi diligemment employés par les adultes que par les enfants. On se sert encore aujourd'hui de patins identiques dans plusieurs de nos provinces" (*Compte Rendu*, p. 625).

In corroboration of Dr Stolpe's statement, as to the survival of the

custom of using bone skates to recent times, I may mention that specimens of them may be seen in the ethnological collections in Stockholm, one of which is engraved in the guide book to the Northern Museum (fig. 82). I also saw some bone skates in the public museum at Visby, in the island of Gotland, in regard to which the curator remarked that he himself in his earlier years had actually used similar skates.

Let me now direct your attention to facts gleaned nearer home. In the year 1866 General Fox-Pitt-Rivers described, at the Anthropological Institute of Great Britain and Ireland, remains of pile-buildings exposed by workmen while making excavations for the foundations of a modern building near the site of a portion of the old London Wall. Here, in a bed of peat 7 to 9 feet thick, intervening between the accumulated rubbish of modern London and a bed of waterworn gravel, were found decayed wooden piles associated with the debris of kitchen middens and a large assortment of industrial remains. The vast majority of the articles collected are undoubtedly of Roman workmanship, but amongst them were others of a ruder character, such as implements made of bone and horn, among which were two bone skates, thus described by the author of the paper above referred to:—

“With them were also found the two bone skates on the table; they are of the metacarpal bone of a small horse or ass, one of which has been much used on the ice. Exactly similar skates also of the metacarpal of the horse or ass have been found in a tumulus of the Stone period at Oosterend in Friesland; a drawing of them is given in Lindenschmit's Catalogue of the Museum at Mayence, &c. Others have also been found in Zeeland, at Utrecht, and in Guelderland, and there is a specimen in the Museum at Hanover. Professor Lindenschmit attributes all these to the Stone period, but the specimens on the table are evidently of the Iron age, the holes in the back having been formed for the insertion of an iron staple. Similar skates have been found in the Thames, but they have not hitherto been considered to date so early in England as in Roman times.”

Mr Roach Smith, in describing a bone skate found at Moorfields, in the boggy soil peculiar to that district, makes the following remarks:—

“A large number of similar skates have been obtained, not only from this locality, but also from various parts of the city. Fitz-Stephen, who lived in

the time of Henry II., in describing the sports of the citizens of London, says : 'When that great moor, which washeth Moorfields at the north wall of the city, is frozen over, great companies of young men go to sport on the ice,' &c. After enumerating the various modes of sliding, he continues : 'Some are better practised to the ice, and bind to their shoes bones, as the legs of some beasts (tibiae scilicet animalium), and hold stakes in their hands, headed with sharp iron, which sometimes they strike against the ice ; and these men go on with speed, as doth a bird in the air, or darts shot from some warlike engine.' . . . In Bishop Percy's *Translations of Runic Poetry*, skating is alluded to as being one of the accomplishments of the North, of the highest character. Harold, in the poem called his *Complaint*, says : 'I know how to perform eight exercises. I fight with courage ; I keep a firm seat on horseback ; I am skilled in swimming ; I glide along the ice on skates ; I excel in darting the lance ; I am dexterous at the oar ; and yet a Russian maid disdains me.'"

" . . . In the twenty-fourth table of the Edda skating is thus spoken of :— Then the King asked what that young man could do who accompanied Thor ? Thielfer answered, that in running upon skates he would dispute the prize with any of the Countries. The king owned that the talent he spoke of was a very fine one. . . .

" Olaus Magnus speaks of the skate as being made of polished iron, or of the shank-bone of a deer or sheep, about a foot long, filed down on one side, and greased with hog's lard to repel the wet.

" My friend Herr Worsae of Copenhagen informs me that skates of bone similar to those in my possession have been found in Holland, in Scandinavia, and particularly in the southern part of Sweden. He also refers to a very curious passage in one of the old Scandinavian mythological songs, in which it is said that *Oller*, or *Uller*, god of the winter, runs on bones of animals over ice.

" Formerly skates of bone were used in Iceland. Indeed, it appears evident that they were in general use in all parts of the North of Europe. I have been informed that they were not entirely superseded by the steel skates in London at the latter part of the last century" (*Collectanea Antiqua*, vol. i. p. 167).

Three bone skates are engraved in the *Proceedings* of the Archaeological Institute (1848), in respect of which the following remarks are made :—

" Skates formed of the leg-bone of a small horse or other animal, discovered in Lincoln. One side was shaved off, presenting a smooth, flat surface, and in some examples there is a transverse perforation through one end, doubtless to



pass a strap, and at the other end another, in a lengthwise direction, which might receive a peg or hook, for the purpose of attachment to the foot. . . . One of the relics of this nature exhibited was of greater length and weight than is suitable for such use, and possibly was used with some kind of sledge, or as a "runner," to facilitate the removal of a boat; it was found in 1848, near an ancient canoe disinterred in forming the Great Northern Railway at Stixwold Ferry." (Lincoln Vol., p. xxxii.)

Two of the above objects are now in the National Museum of Edinburgh; also three other bone skates dug up in Moorfields, London. The two from Lincoln which are here represented (fig. 2), are described

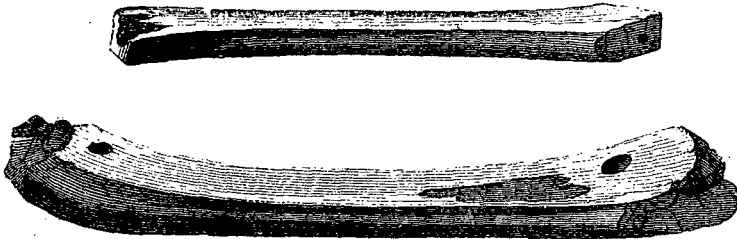


Fig. 2. Skate and Runner, each made of the leg-bone of a horse, found at Arches, and Stixwold Ferry, Lincoln.

in the *Proceedings* of the Society of Antiquaries of Scotland as follows (vol. vi. p. 314):—

"Ancient bone skate,  $9\frac{1}{2}$  inches in length, one extremity being cut to a point. It was found, at a depth of 70 feet, in the parish of St Peter's, at Arches, Lincoln."

"Another specimen, measuring 14 inches in length, pierced with a hole at each extremity. Found in 1848, at Stixwold Ferry, near Lincoln."

In the Museum at York there are a few skates exhibited which are thus referred to in the Handbook:—

"Ancient skates, formed of the leg-bones of horses, polished on one side. They are frequently found in York, as at London and Lincoln, and were probably introduced into England by the Danes."

These are all the materials I have been able to collect on the subject, but I daresay they might be considerably increased by a more careful

search among old documents and in local museums. I do not, however, think that any additional data so gleaned would materially alter the conclusions pointed at by the facts I have laid before you. The function of a skate assumes the existence of a climate capable of producing ice of sufficient strength and duration to afford scope for the practice of this mode of locomotion. Hence the climatal element would alone restrict their distribution, whether in past or present times, to the northern and colder regions of Europe. But the geographical area of ancient bone skates, as revealed by the discoveries above recorded, seems to me to be more limited than that which climate alone demands. Thus in Britain they have been found only in a comparatively small district extending along the eastern shore-land from York to London. This is merely the western fringe of the area of their geographical distribution, which, as we have seen, embraced Holland, Denmark, the lower portions of Scandinavia, and North Germany. But before disposing of the significance of this point, it will be necessary to inquire into their distribution in time.

Probably the pastime of skating is more prevalent now than at any former period in the world's history, so that the discontinuance of bone skates does not mark the death of a custom, but merely the substitution of a more suitable material than the animal bones which had originally served for this method of locomotion. Nor is there any exceptional interest attached to the gradual abandonment of these primitive skates more than to any other of the superseded implements of our common industries, such as querns, spindle-whorls, spinning-wheels, corn-hooks, &c. It is more especially at the other end of the chronological chain marked out by the appearance of bone skates on the field of European civilisation that their archæological interest lies. While their dying-out stage has lingered on in some quarters almost to the present day, the facts bearing on their origin, so far as hitherto correlated, leave the question, both as to time and locality, in the greatest doubt. Dr Lindenschmit, as already mentioned, includes them among prehistoric objects of the Stone age. In support of this view no less than four of the above recorded instances of discovery might be cited with some show of plausibility, viz., the grave-mound at Oosterend in Friesland, and the lake-dwellings of Kownatken, Starnberg, and Moosseedorf. The

suggestion that the perforated bone found in a *terramara* in Hungary was a skate, rests on too slender a basis to be taken into account.

We will now examine *seriatim* the circumstances in which bone skates have been found in those four localities, with the view of showing that not one of them can be fairly accepted as a genuine product of the earlier civilisation with whose remains it had become associated.

That the bone skate figured by Lindenschmit came from a grave-mound at Oosterend we have no evidence except the bare statement. I do not, however, question the *bona fides* of this statement, either on the part of Dr Lindenschmit or of the discoverer of the object; but I cannot help thinking that the so-called *Grab-hügel* was nothing more than a *Terp-hügel*. At that time the nature of the *terpen* was not known, and it is quite natural to suppose that an artificial accumulation of earth, containing a novel object of human workmanship, would be unhesitatingly considered as a burial-mound. Oosterend is situated a few miles south-west of Leeuwarden, in a district abounding with *terp*-mounds. Such a locality, liable to be overrun with the tides prior to the construction of the great dykes which now hem back the ocean, was not likely to be selected by prehistoric Man as a suitable place for the construction of a *Grab-hügel*.

The circumstances in which the other specimens mentioned by Lindenschmit were found are not stated, being apparently unknown, so that his Stone-age theory of their origin is founded on one example reported merely on hearsay evidence to have come from a grave-mound. The observations made by Baron van Breugel Douglas, already quoted, would appear to have been founded on Dr Lindenschmit's opinion.

The finding of bone skates on some of the lake-dwellings of North Germany is quite in keeping with the mediæval character generally assigned to these structures. Nor am I inclined to remove from this category the Kownatken lake-dwelling, notwithstanding that a few articles of the Stone age were found on it. From this circumstance Professor Heydeck of Königsberg thinks that the settlement should be relegated back to prehistoric times. But, on the other hand, Professor Virchow, who has paid great attention to the phenomena of *Pfahlbauten*, ascribes all the lacustrine structures in North Germany to a much later

period than their analogues in Switzerland. "Ich denke," says he, "wir werden uns entschliessen müssen, ganz in Gegensatze zu den süddeutsch-schweizenschen Pfahlbauten, die Einführung der nördlichen Pfahlbauten an die Einwanderung des Slavo-lettischen Stammes anzuknüpfen."

In declining to accept the suggested prehistoric origin of the Kownatken settlement on the ground of finding a few relics of the Stone age on it, we are supported by evidence derived from various collateral phenomena of an analogous character. A mixture of relics, apparently belonging to the earlier ages, is a feature common to many of the lake-dwellings of Ireland and Scotland. We might with equal logical consistency argue that the Lochlee crannog was founded in the Stone age, because among its relics were a stone axe and a flint scraper. But, in this case, such a conclusion would be absurd in face of the fact that in the same relic-bed, and almost in the very same spot where this stone axe lay, there was also an iron knife (see *Ancient Scottish Lake-Dwellings*, p. 147). And moreover, the very wooden structures which formed the foundations of the crannog, and consequently preceded the use of all the relics, bore unmistakable evidence of having been fashioned with iron tools.

In regard to the *Rosen Insel*, in the Lake of Starnberg, there can be no doubt that a pile-settlement of the Bronze age flourished here, but, as already explained, the locality continued to be occupied by successive races up to the present time, so that in the absence of any positive evidence to show that the bone skate belonged to the earlier inhabitants, its discovery does not legitimately carry us back beyond the later period.

Only one other bone skate, labelled prehistoric, remains to be explained away, viz., that from the lake-dwelling at Moosseedorf. This settlement is one of the most typical of the Stone age in Switzerland, and has yielded a large assortment of relics characteristic of that period, but none of the later ages, so that it appears to have come to an end prior to the Bronze age. Moosseedorfsee was a small lake which became frozen over every winter, and thus afforded special facilities for skating. What, therefore, could be more probable than that, at any subsequent time, some person, enjoying the pastime of skating, would drop one of his skates over the site of the lake-dwelling? We must remember that after the destruction of the settlement not a vestige of its wood-work

would remain above water to prevent such an occurrence at any time during the last two thousand years. The bone skate from Moosseedorfsee is thus not only an isolated and stray object among the lacustrine antiquities of Switzerland, but, so far as I know, nothing of the kind has ever been found in any station of the Stone or Bronze age in Europe. Its presence among the relics of the primitive lake-dwellers at Moosseedorf seems to me pretty much on a par with the finding of an exploded gun-cartridge at the bottom of a prehistoric cairn.

From these facts and observations, I am of opinion that we have no trustworthy evidence in support of the theory that bone skates were ever used in prehistoric times in Europe. On the contrary, they appear to have been invented by the early Teutonic races who inhabited the shores of the Baltic, and to have been introduced into Britain by the early immigrants who hailed from these regions, possibly the superfluous inhabitants of the *Terpen*.

As a corollary to this discussion, let me observe that it is always of importance to archæologists to be acquainted with the special characteristics of any well-marked civilisation. If this conclusion as to the origin and distribution of bone skates be well founded, their discovery in a pile-structure in London, notwithstanding that they were associated with objects undoubtedly emanating from Roman sources, may have a determinative significance on the nature of these remains not hitherto sufficiently recognised.

*P.S.*—Since writing these notes I have had an opportunity of seeing a few more bone skates. In the *Naturhistorisches Museum*, Vienna, there are five or six examples from Bohemia. Two of these were found associated with objects which, in the opinion of Dr Moriz Hoernes, might be regarded as bordering on prehistoric times. The others have a more recent appearance, and are probably products of mediæval times. In the National Museum at Buda-Pesth are several metacarpal bones of the horse or ass, shaped and perforated like bone skates, but none of these objects presents a polished surface, and it is possible that they may have been used for a different purpose. One specimen in the *Joanneum Museum* at Graz is clearly of recent origin, but it has no history.—R. M.